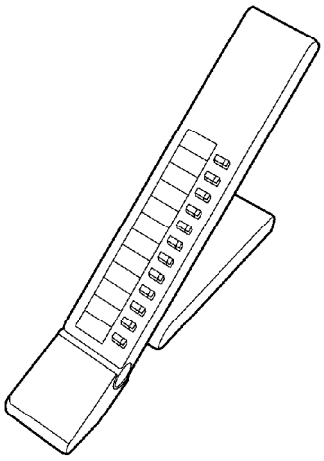
ORDER NO. KMS0303669C8

Service Manual

Add on Key Module

KX-T7603X

(for Asia, MiddleNear East, Africa, Oceania, Latin America, Russia, Europe)



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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

When you note the serial number, write down all of the 11 digits. The serial number may be found on the unit.

Panasonic

IMPORTANT INFORMATION ABOUT LEAD FREE, (PbF), SOLDERING

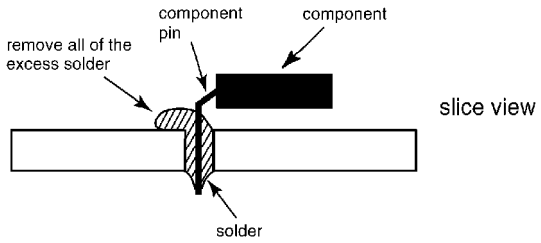
If lead free solder was used in the manufacture of this product the printed circuit boards will be marked PbF.
Standard leaded, (Pb), solder can be used as usual on boards without the PbF mark.
When this mark does appear please read and follow the special instructions described in this manual on the use of PbF and how it might be permissible to use Pb solder during service and repair work.

1. ABOUT LEAD FREE SOLDER (PbF: Pb free)

Note:
In the information below, Pb, the symbol for lead in the periodic table of elements, will refer to standard solder or solder that contains lead.
We will use PbF when discussing the lead free solder used in our manufacturing process which is made from Tin, (Sn), Silver, (Ag), and Copper, (Cu).
This model, and others like it, manufactured using lead free solder will have PbF stamped on the PCB. For service and repair work we suggest using the same type of solder although, with some precautions, standard Pb solder can also be used.

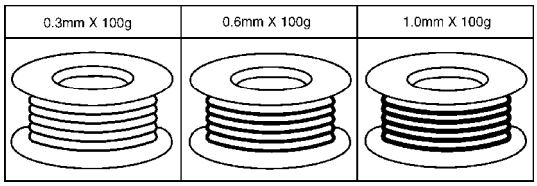
Caution

- **PbF solder has a melting point that is 50° ~ 70° F, (30° ~ 40°C) higher than Pb solder. Please use a soldering iron with temperature control and adjust it to 700° ± 20° F, (370° ± 10°C). In case of using high temperature soldering iron, please be careful not to heat too long.**
- **PbF solder will tend to splash if it is heated much higher than its melting point, approximately 1100°F, (600°C).**
- **If you must use Pb solder on a PCB manufactured using PbF solder, remove as much of the original PbF solder as possible and be sure that any remaining is melted prior to applying the Pb solder.**
- **When applying PbF solder to double layered boards, please check the component side for excess which may flow onto the opposite side (See figure, below).**



1.1. SUGGESTED PbF SOLDER

There are several types of PbF solder available commercially. While this product is manufactured using Tin, Silver, and Copper,
(Sn+Ag+Cu), you can also use Tin and Copper, (Sn+Cu), or Tin, Zinc, and Bismuth, (Sn+Zn+Bi). Please check the manufac
turer's specific instructions for the melting points of their products and any precautions for using their product with other
materials.
The following lead free (PbF) solder wire sizes are recommended for service of this product: 0.3mm, 0.6mm and 1.0mm.



1.2. HOW TO RECOGNIZE THAT Pb FREE SOLDER IS USED

PbF is stamped to show that Pb free solder is used. (See the figure below.)

2. FOR SERVICE TECHNICIANS

ICs and LSIs are vulnerable to static electricity.
When repairing, the following precautions will help prevent recurring malfunctions.

1. Cover the plastic parts boxes with aluminum foil.

2. Ground the soldering irons.

3. Use a conductive mat on the worktable.

4. Do not touch IC or LSI pins with bare fingers.

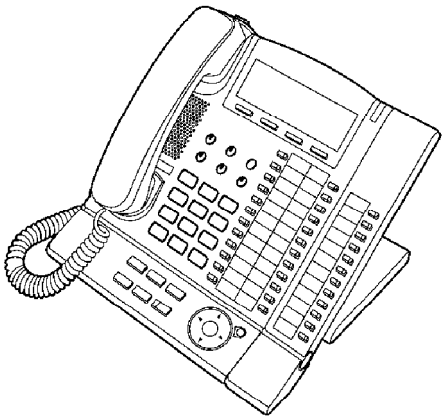
3. SPECIFICATIONS

Jacks:	**TEL Jack**	
Dimensions:	**Low Angle:**	**255 (D)mm [Operate] × 47 (W)mm × 94 (H)mm**
		206 (D)mm [Operate] × 47 (W)mm × 178 (H)mm
	High Angle:	**213 (D)mm [Base]**
Weight:	**210g**	

Design and specifications are subject to change without notice.

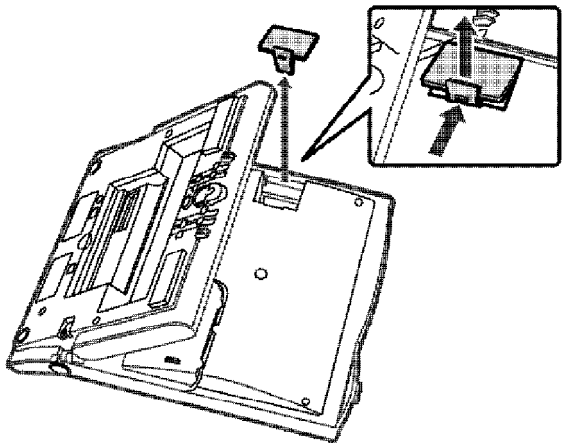
4. INSTALLING

For KX-T7633 / KX-T7636
The Add-on Key Module has 12 CO buttons. These buttons are used to seize an outside line, make a call using One-touch Dialing, or access certain features.

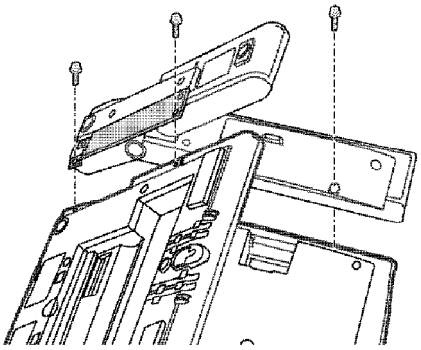


(with a KX-T7603)

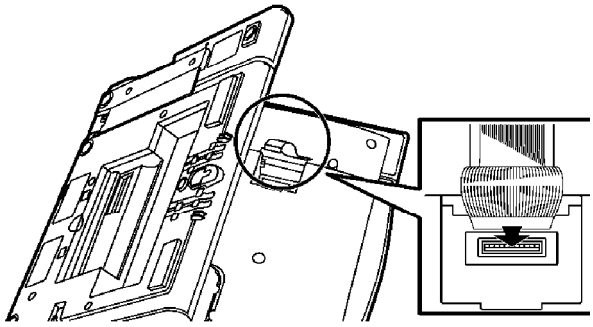
1 Open the cover.



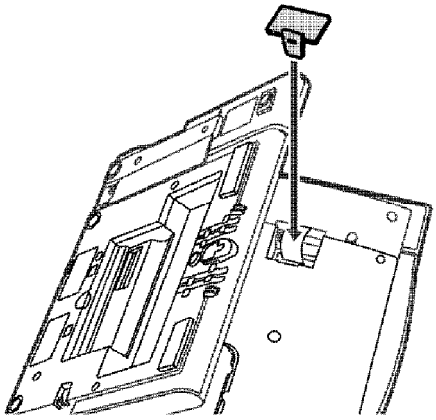
2 Attach the KX-T7603 to your telephone with screws.



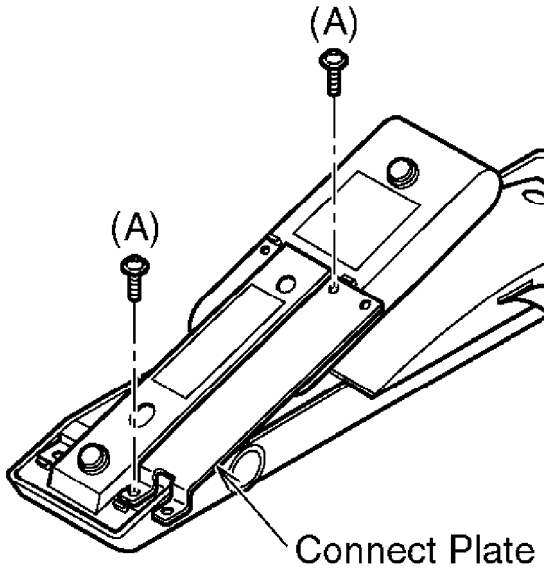
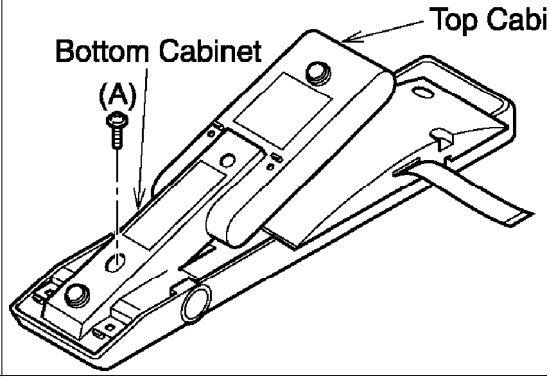
3 Insert the flat cable into the connector.

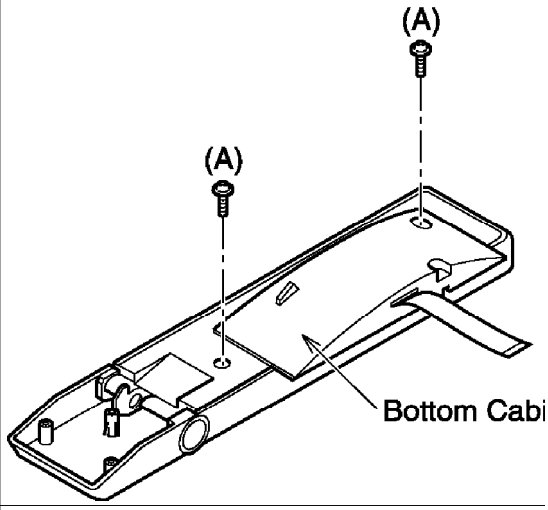
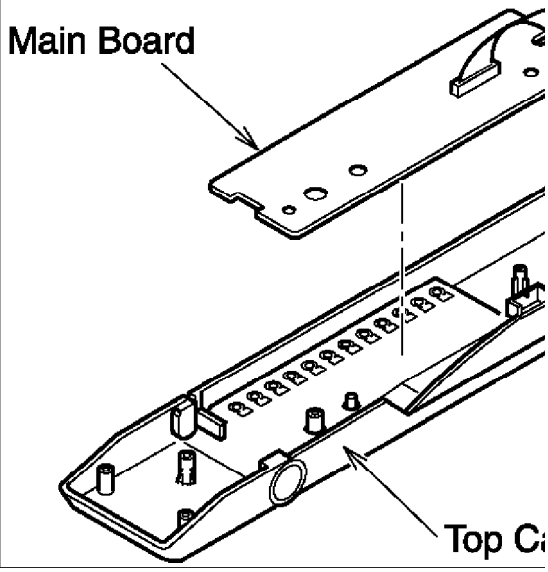


4 Close the cover.



5. DISASSEMBLY INSTRUCTIONS

1. Remove Two Screws (A). **2. Remove the Connect Plate.**	
3. Remove Screw (A). **4. Remove the Bottom Cabinet and Top Cabinet (Base).**	

5. Remove Two Screws (A). 6. Remove the Bottom Cabinet (Oper).	
7. Remove the Main Board from the Top Cabinet.	

6. HOW TO REPLACE A FLAT PACKAGE IC

6.1. PREPARATION

- PbF (: Pb free) Solder

- Soldering Iron

Tip Temperature of 700°F ± 20°F (370°C ± 10°C)

Note: We recommend a 30 to 40 Watt soldering iron. An expert may be able to use a 60 to 80 Watt iron where someone with less experience could overheat and damage the PCB foil.

- Flux

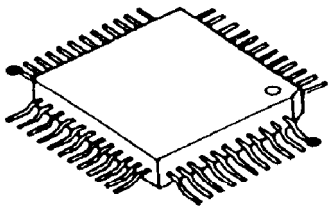
Recommended Flux: Specific Gravity → 0.82.

Type → RMA (lower residue, non-cleaning type)

Note: See ABOUT LEAD FREE SOLDER (PbF: Pb free) ().

6.2. PROCEDURE

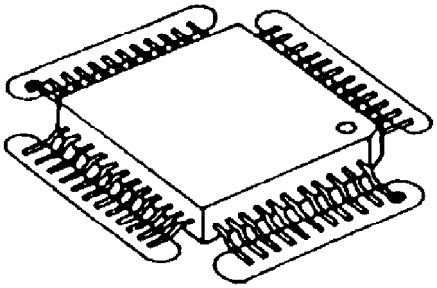
1. **Tack the flat pack IC to the PCB by temporarily soldering two diagonally opposite pins in the correct positions on the PCB.**



● – – – – – – Temporary soldering point.

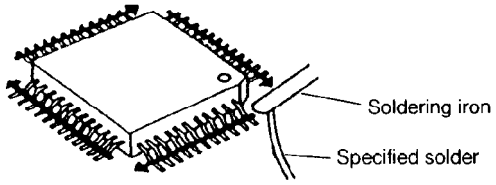
Be certain each pin is located over the correct pad on the PCB.

2. **Apply flux to all of the pins on the IC.**



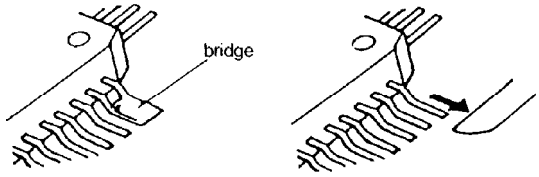
– – – – – – Flux

3. **Being careful to not unsolder the tack points, slide the soldering iron along the tips of the pins while feeding enough solder to the tip so that it flows under the pins as they are heated.**

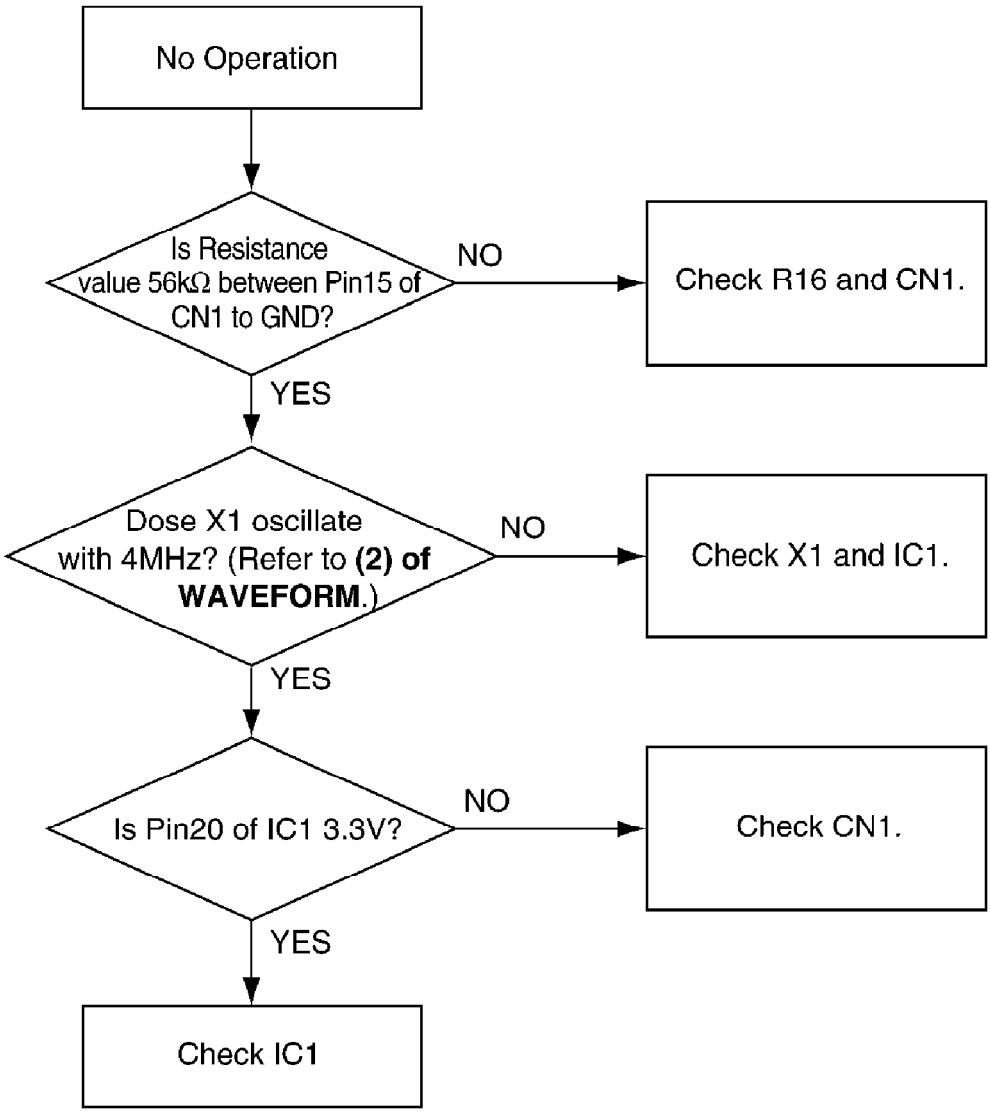


6.3. REMOVING SOLDER FROM BETWEEN PINS

1. **Add a small amount of solder to the bridged pins.**
2. **With a hot iron, use a sweeping motion along the flat part of the pin to draw the solder from between the adjacent pads.**



7. TROUBLESHOOTING GUIDE



CROSS REFERENCE:
WAVEFORM ()

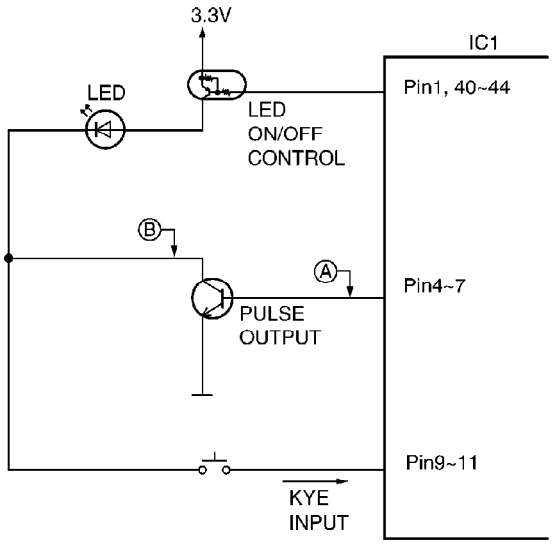
8. BLOCK DIAGRAM

9. CIRCUIT OPERATIONS

9.1. LED CIRCUIT AND KEY INPUT CIRCUIT

Circuit Operation:
A drive pulse wave, as in Fig.1, is output by IC1. That signal goes through the drive digital transistor and connects the key button and LED cathode. By pressing the key, the drive pulse wave is input to Pin9~Pin11. In order to light the appropriate LED, the LED control port is turned ON. That result LED is lit by the pulse Driver.

Circuit Diagram



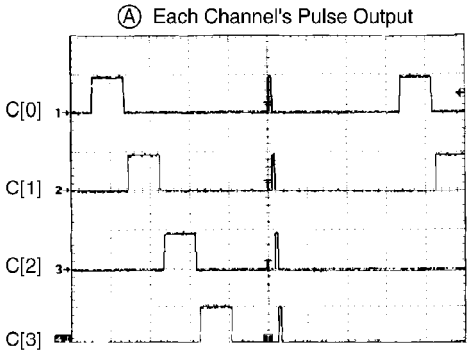


Fig.1

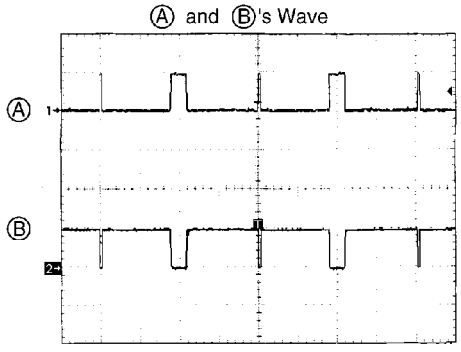
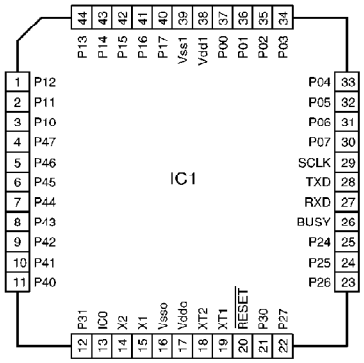


Fig.2

10. IC DATA

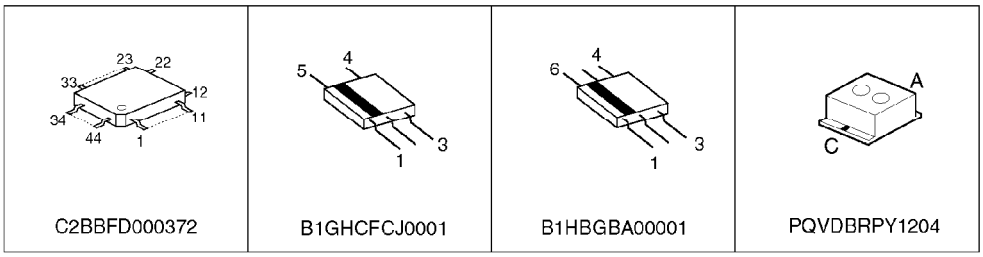


Program ROM:	16kbyte
Internal RAM:	512byte
Clock Frequency:	4.0MHz
Power Supply Voltage:	3.3V

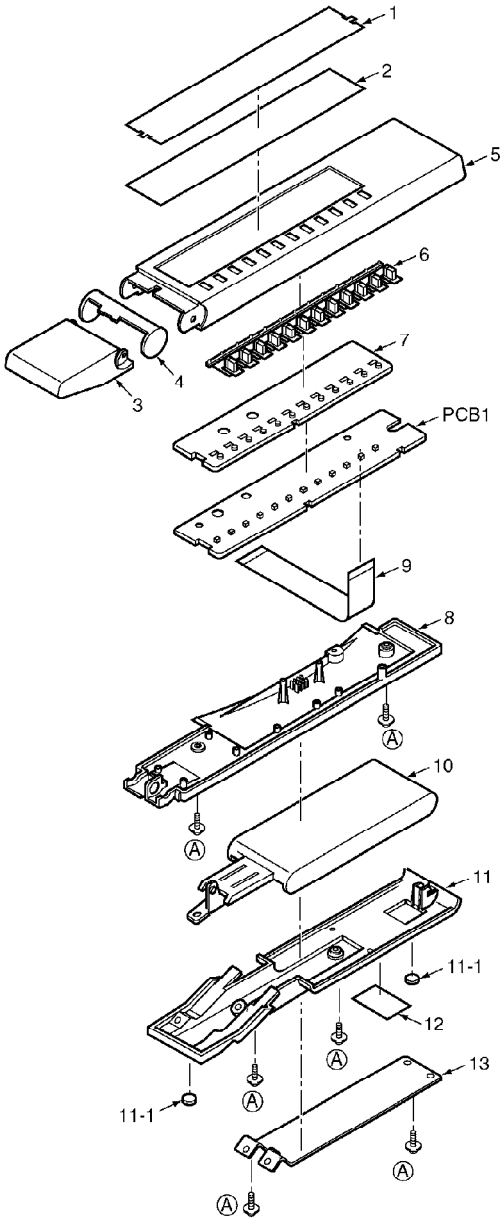
Pin No.	Terminal Name	I/O Setting	Description
1	P12	O	LED-K6
2	P11	I	Not used Vss Connection
3	P10	I	Not used Vss Connection
4	P47/KR07	O	LED-C1
5	P46/KR06	O	LED-C2
6	P45/KR05	O	LED-C3
7	P44/KR04	O	LED-C4
8	P43/KR03	I	Not used Vss Connection
9	P42/KR02	I	KEY-IN3
10	P41/KR01	I	KEY-IN2
11	P40/KR00	I	KEY-IN1
12	P31/BZO90	I	Not used Vss Connection
13	IC0	I	Vpp
14	X2	O	OSC(4MHz)
15	X1	I	OSC(4MHz)
16	Vss0	-	Vss
17	Vdd0	-	Vdd
18	XT2	-	Not used Open
19	XT1	I	Not used Vss Connection
20	RESET/	I	Reset/
21	P30/TO90	I	Not used Vss Connection
22	P27/TI80/TO80	I	Not used Vss Connection
23	P26/INTP2/CPT90	I	Not used Vss Connection
24	P25/INTP1	I	Not used Vss Connection
25	P24/INTP0	I	Not used Vss Connection
26	P23/SS20/	I	Rx-RDY
27	P22/SI20/RxD20	I	RxD
28	P21/SO20/TxD20	O	TxD
29	P20/SCK20// ASCK20	I	SCK
30	P07	I	Not used Open
31	P06	I	Not used Open
32	P05	I	Not used Open
33	P04	I	Not used Vss Connection

Pin No.	Terminal Name	I/O Setting	Description
34	P03	I	Not used Vss Connection
35	P02	I	Not used Vss Connection
36	P01	I	Not used Vdd Connection
37	P00	I	Not used Vdd Connection
38	Vdd1	-	Vdd
39	Vss1	-	Vss
40	P17	O	LED-K1
41	P16	O	LED-K2
42	P15	O	LED-K3
43	P14	O	LED-K4
44	P13	O	LED-K5

11. TERMINAL GUIDE OF ICs, TRANSISTORS AND DIODES



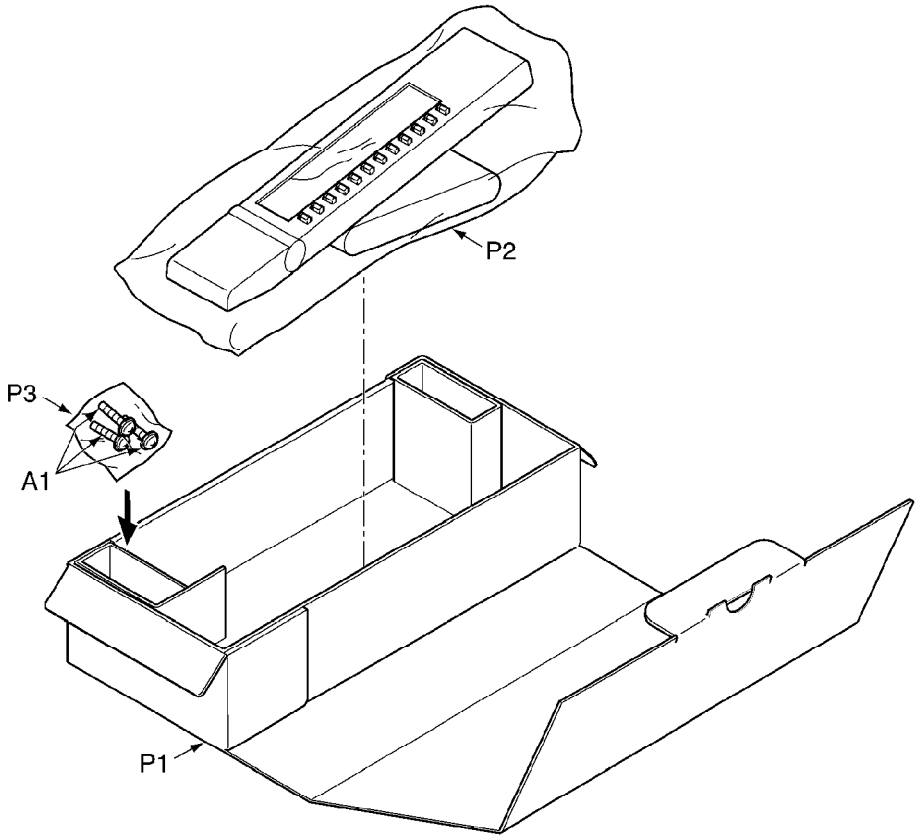
12. CABINET AND ELECTRICAL PARTS LOCATION



SCREWS

Ref. No.	Figure	Part No.
Ⓐ	(ϕ 3 × 12 mm)	XTW3+S12P

13. ACCESSORIES AND PACKING MATERIALS



14. REPLACEMENT PARTS LIST

1. RTL (Retention Time Limited)

Note:

The marking (RTL) indicates that the Retention Time is limited for this item.

After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependent on the type of assembly, and in accordance with the laws governing parts and product retention.

After the end of this period, the assembly will no longer be available.

2. Important safety notice

Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacture's specified parts.

3. The S mark means the part is one of some identical parts. For that reason, it may be different from the installed part.
4. ISO code (Example: ABS-HB) of the remarks column shows quality of the material and a flame resisting grade about plastics.
5. RESISTORS & CAPACITORS
   Unless otherwise specified;
   All resistors are in ohms (Ω) K=1000 Ω , M=1000k Ω
   All capacitors are in MICRO FARADS (μ F) P= μ μ F
   *Type & Wattage of Resistor

Type

ERC:Solid	ERX:Metal Film	PQ4R:Carbon
ERD:Carbon	ERG:Metal Oxide	ERS:Fusible Resistor
PQRD:Carbon	ER0:Metal Film	ERF:Cement Resistor

Wattage

10,16:1/8W	14,25:1/4W	12:1/2W	1:1W	2:2W	3:3W

*Type & Voltage of Capacitor

Type

ECFD:Semi-Conductor	ECCD,ECKD,ECBT,PQCBC : Ceramic
ECQS:Styrol	ECQE,ECQV,ECQG : Polyester
PQCUV:Chip	ECEA,ECSZ : Electrolytic
ECQMS:Mica	ECQP : Polypropylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others	
1H: 50V	05: 50V	0F:3.15V	0J :6.3V	1V :35V
2A:100V	1:100V	1A:10V	1A :10V	50,1H:50V
2E:250V	2:200V	1V:35V	1C :16V	1J :63V
2H:500V		0J:6.3V	1E,25:25V	2A :100V

14.1. CABINET AND ELECTRICAL PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
1	PSHR1253Z	TRANSPARENT PLATE	
2	PSGD1064Z	TEL. CARD	
3	PSKM1087Z1	CABINET BODY, APRON	ABS-HB
4	PSKK1041Z2	DOOR-LID, SHAFT COVER	ABS-HB
5	PSKM1086Z1	CABINET BODY, UPPER	ABS-HB
6	PSBX1090Z1	PUSH BUTTON, CO KEY	ABS-HB
7	PSSX1020Z	KEYBOARD SWITCH	
8	PSKF1056Z1	CABINET COVER, LOWER	ABS-HB
9	PSJE1033Z	LEAD WIRE	
10	PSKM1088Z1	CABINET BODY, UPPER BASE	ABS-HB
11	PSYF1038Z1	LOWER CABINET COVER ASS'Y	PS-HB
11-1	PSHA1010Z	RUBBER PARTS, FOOT	
12	PSGT2185Z	NAME PLATE	
13	PSMH1226Z	ANGLE, CONNECT PLATE	

14.2. PACKING MATERIALS

Ref. No.	Part No.	Part Name & Description	Remarks
A1	XTW3+S12P	TAPPING SCREW, STEEL	
P1	PSZKT7603X	GIFT BOX ASS'Y	
P2	XZB34X48A05	PROTECTION COVER	
P3	XZB05X08A03	PROTECTION COVER	

14.3. MAIN BOARD PARTS

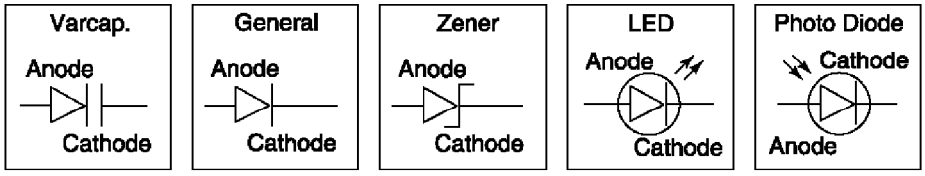
Ref. No.	Part No.	Part Name & Description	Remarks
PCB1	PSWPT7603X	P. C. BOARD ASS'Y (RTL)	
		(IC)	
IC1	C2BBFD000372	IC	
		(TRANSISTORS)	
Q1	B1GHCFCJ0001	TRANSISTOR(SI)	
Q2	B1GHCFCJ0001	TRANSISTOR(SI)	
Q3	B1GHCFCJ0001	TRANSISTOR(SI)	
Q4	B1HBGBA00001	TRANSISTOR(SI)	
Q5	B1HBGBA00001	TRANSISTOR(SI)	
		(DIODES)	
D1~D12	PQVDBRPY1204	LED	S
		(CONNECTOR)	
CN1	PSJS18A74Z	CONNECTOR, 18 PIN	
		(COMPONENT PARTS)	
RA1	D1H81224A010	RESISTOR ARRAY, 1.2k	
		(CRYSTAL OSCILLATOR)	
X1	PQVBCST400MG	CRYSTAL OSCILLATOR	S
		(RESISTORS)	
R1	ERJ3GEYJ220	22	
R2	ERJ3GEYJ151	150	
R3	ERJ3GEYJ220	22	
R4	ERJ3GEYJ151	150	
R5	ERJ3GEYJ220	22	
R6	ERJ3GEYJ151	150	
R10	ERJ3GEYJ104	100k	
R11	ERJ3GEYJ101	100	
R12	ERJ3GEYJ101	100	
R13	ERJ3GEYJ101	100	
R14	ERJ3GEYJ101	100	
R15	ERJ3GEYJ103	10k	
R16	ERJ3GEYJ563	56k	
		(CAPACITORS)	
C1	ECUV1C104ZFV	0.1	
C2	F2G0J1010014	100	
C3	ECUV1H103KBV	0.01	S

Ref. No.	Part No.	Part Name & Description	Remarks

15. FOR THE SCHEMATIC DIAGRAM

Note:

1. **DC voltage measurements are taken with an oscilloscope or a tester with a ground.**
2. **The schematic diagrams and circuit board may be modified at any time with the development of new technology.**



Important safety notice
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16. SCHEMATIC DIAGRAM

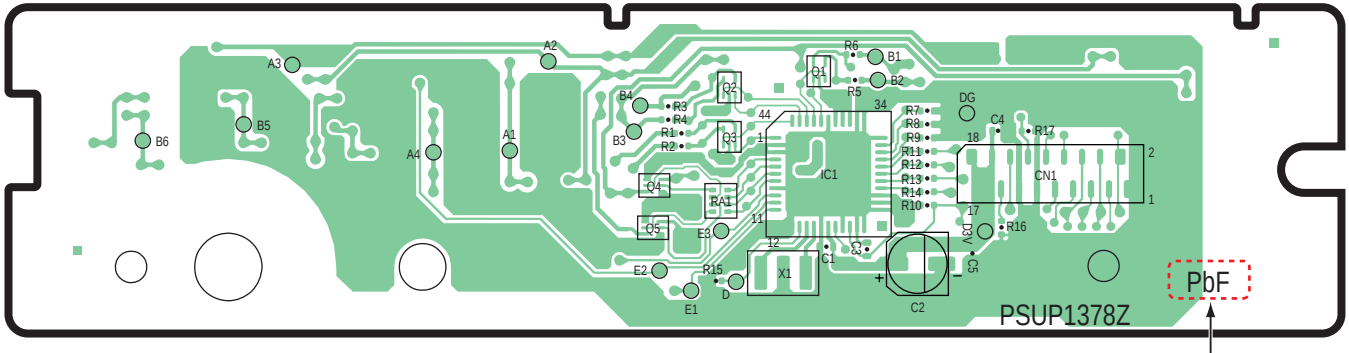
17. WAVEFORM

18. PRINTED CIRCUIT BOARD

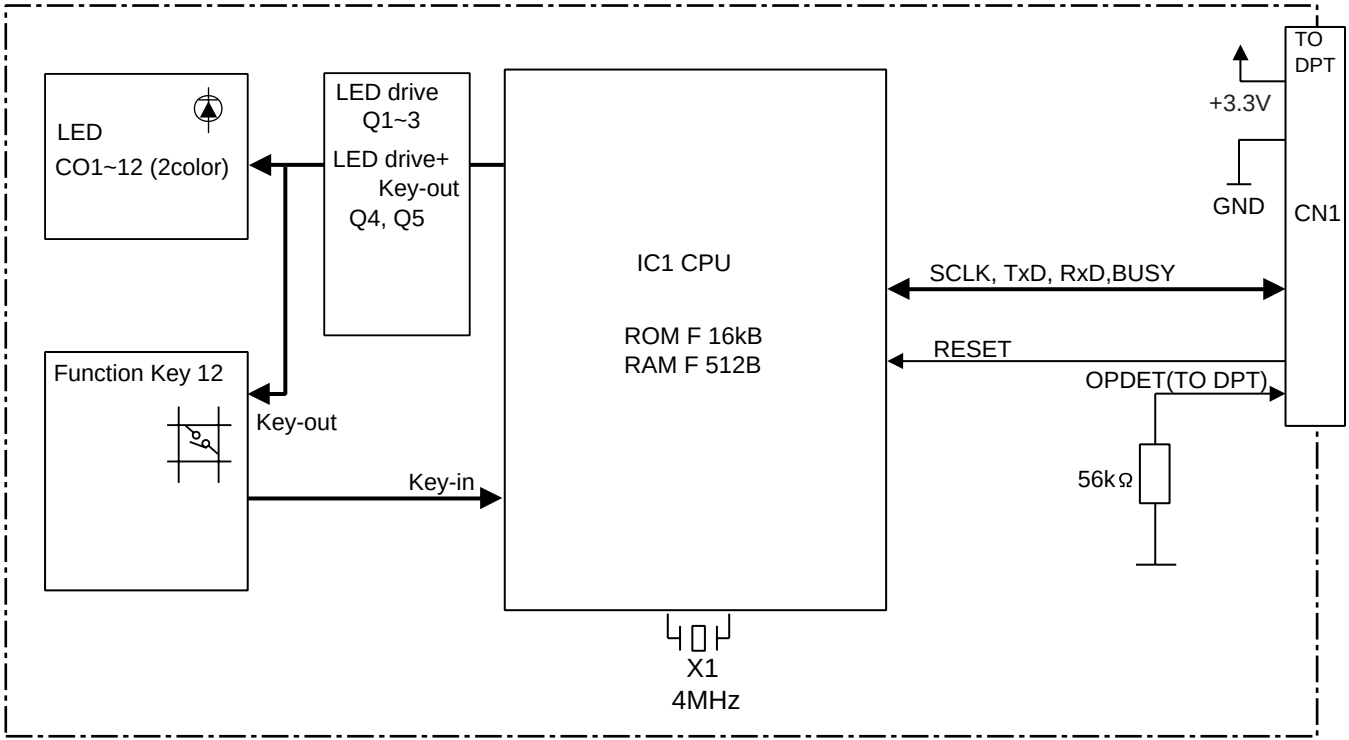
18.1. COMPONENT VIEW

18.2. BOTTOM VIEW

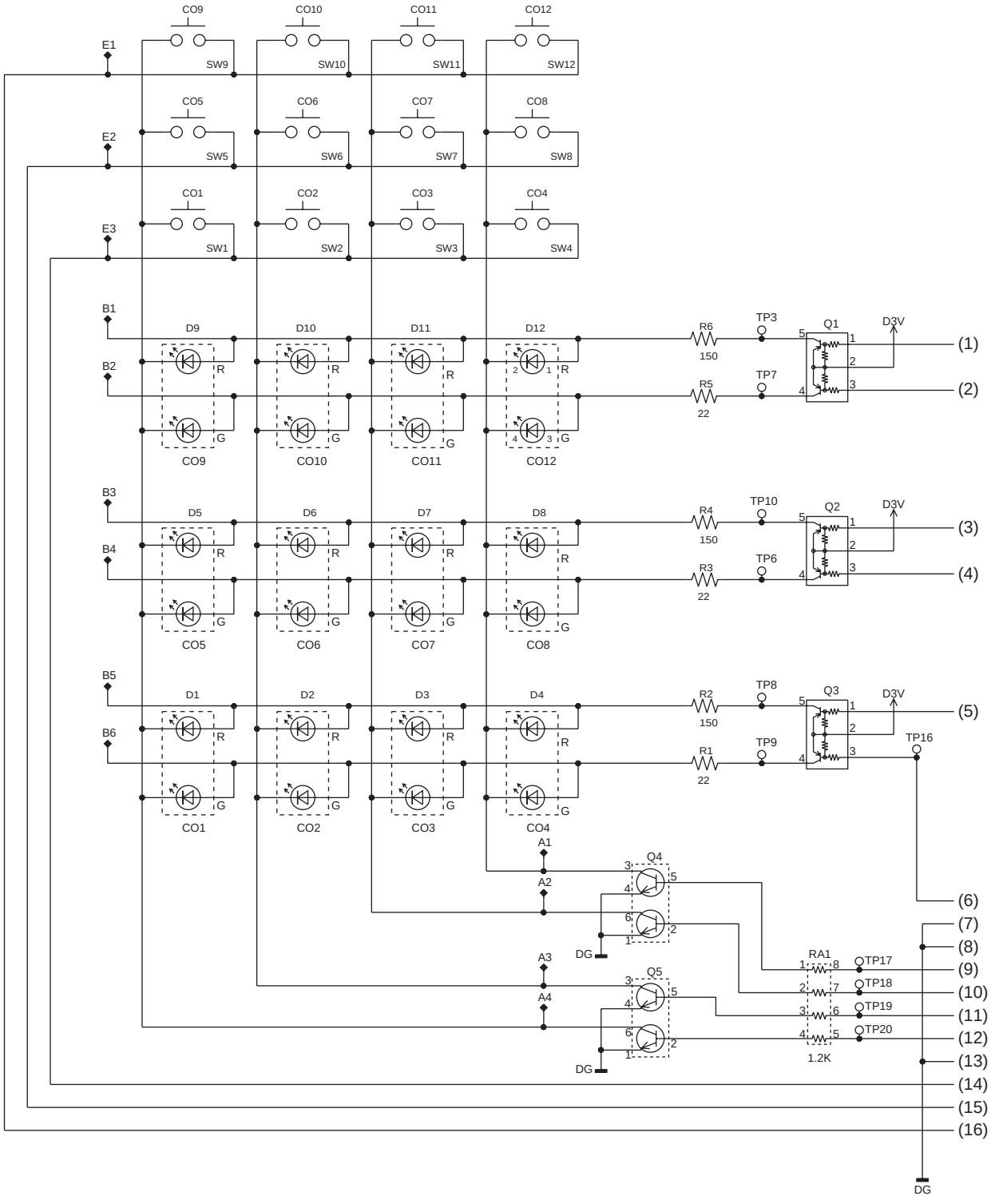
Y / KXT7603X /


A3
A2
B6
B5
A4
A1
B4
B3
R3
R4
R1
R2
Q2
Q3
Q4
Q5
RA1
E3
E2
E1
R15
D
44
1
11
12
IC1
X1
C1
R6
B1
Q1
B2
R5
34
DG
C4
R7
R8
R9
R11
R12
R13
R14
R10
18
17
R17
CN1
2
1
R16
C3
C2
PbF
PSUP1378Z

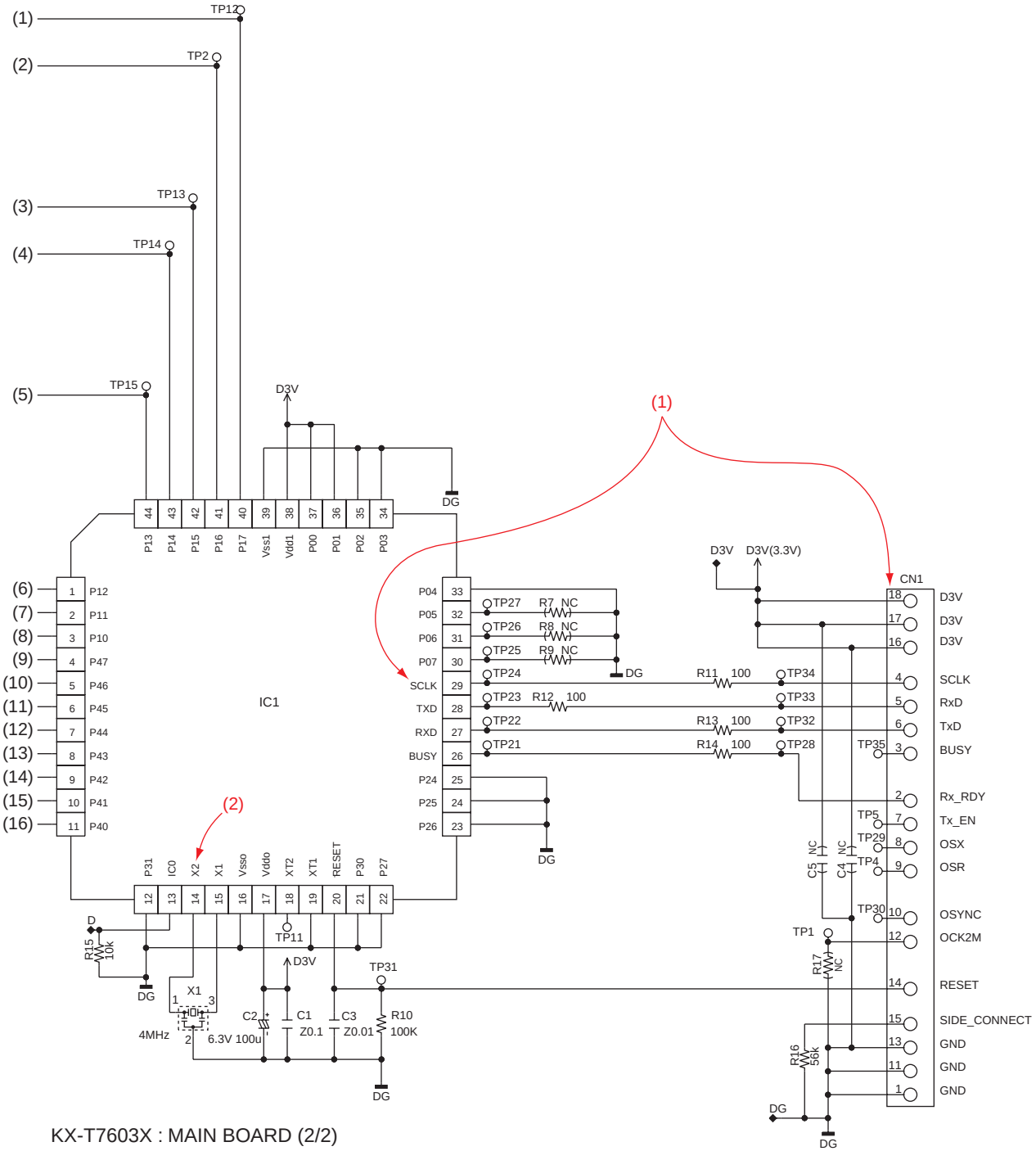
Marked PbF



KX-T7603X : BLOCK DIAGRAM

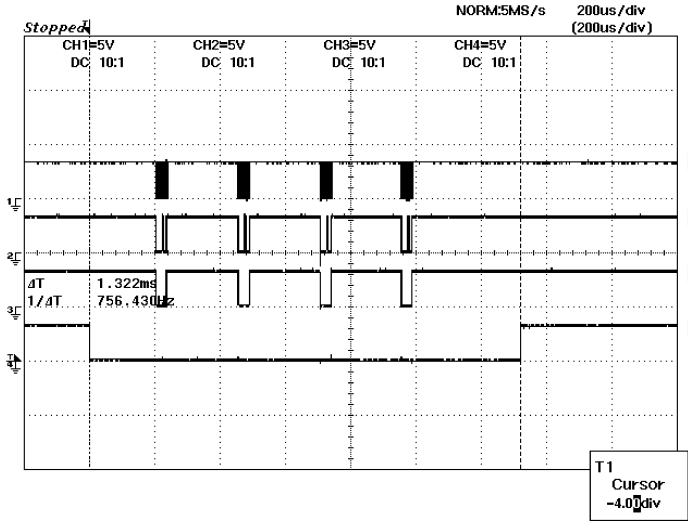


KX-T7603X : MAIN BOARD (1/2)



KX-T7603X : MAIN BOARD (2/2)

(1) Between DPT and T7603
Communication waveform



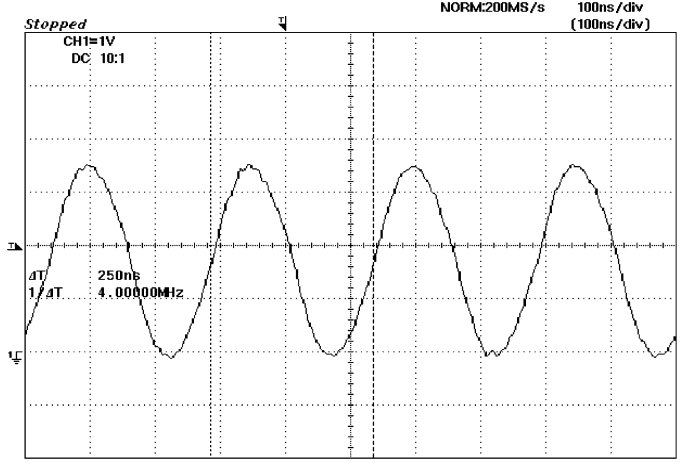
Pin29 of IC1

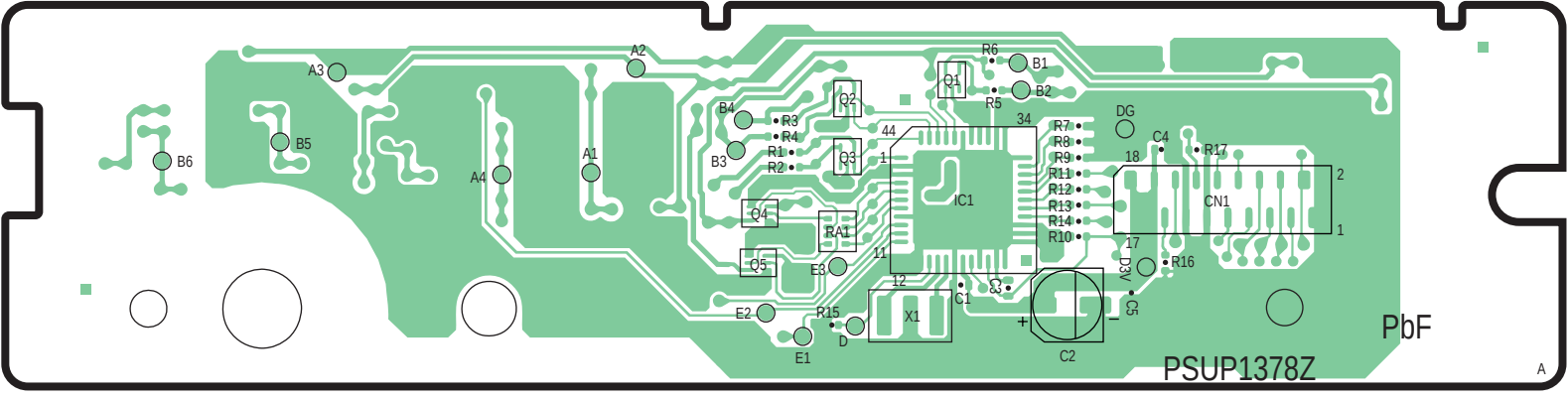
Pin5 of CN1

Pin6 of CN1

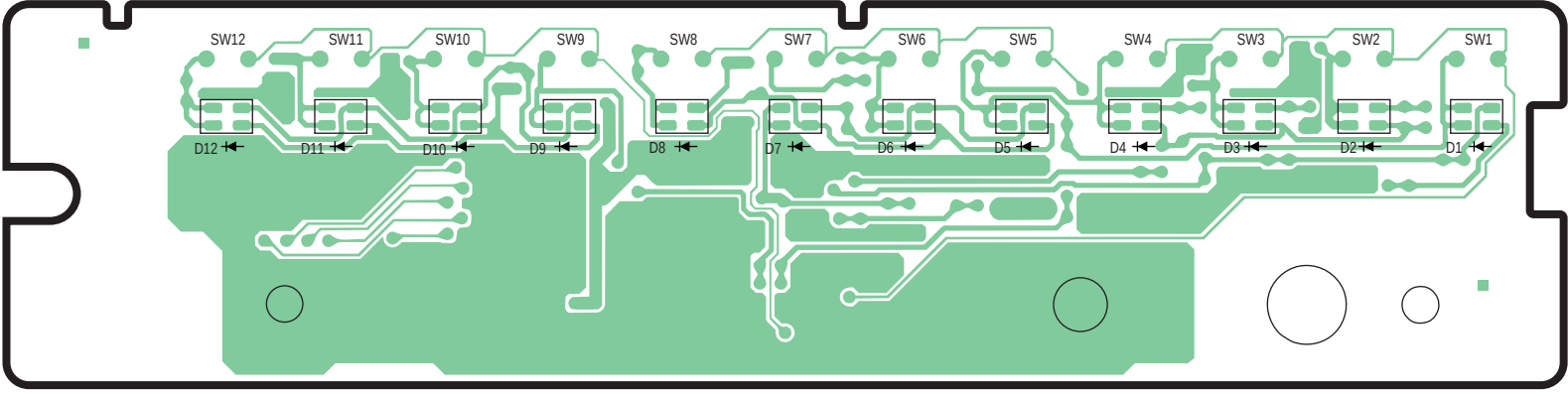
Pin2 of CN1

(2) Pin14 of IC1 4.00MHz





KX-T7603X : COMPONENT VIEW



KX-T7603X : BOTTOM VIEW